AUGUSTINE O'KEEFE, University of Kentucky

Cellular resolutions of some monomial ideals

In 2009 Nagel and Reiner showed that the minimal free resolution of $\mathfrak{m}^d$, where $\mathfrak{m}$ is the maximal ideal of the polynomial ring $k[x_1, \ldots, x_n]$, is supported by a mixed subdivision of $d\Delta_n$, the d^{th} dilation of the $n-1$-dimensional simplex. In this talk we will explore monomial ideals of the form $\mathfrak{m}^d + \langle x_1^{a_1}, \ldots, x_n^{a_n} \rangle$ and show that their minimal free resolutions are supported by a deformation of the aforementioned mixed subdivision of $d\Delta_n$. As a special case, we can show that the initial ideals of Riemann-Roch monomial ideals, introduced by Manjunath and Sturmfels in 2012, have minimal cellular resolutions.